Appendix X
OT Entrance Criteria Templates

Section I
Templates Uses

X–1. Overview
Proper risk management requires the development of a systematic, disciplined plan to identify problems and risks. A proven risk management technique is to examine the successes, failures, problems, and solutions of similar (or past) programs for "lessons learned" that can be applied to current programs. Another technique is to systematically comb through the entire set of programs using specific decision criteria based on historical data. The establishment of entrance criteria combines these techniques with a system for assigning responsibility and tracking accountability for results.

X–2. Scope
The matrix of templates in table X–1 cover a broad range of subjects that have historically impacted systems transitioning from DT to OT. Not all templates may apply to every program. The templates are arranged in three major groups: Test Planning and Documentation; System Design and Performance; and Test Assets and Support. These templates may be used in conjunction with the templates in DODD 4245.7–M, Transition from Development to Production. All templates are designed to increase the visibility of potential risk factors and facilitate a streamlined, executive-level review. Reference the appropriate figure for additional template information.

Table X–1
OT entrance criteria matrix of templates

Test planning and documentation		System design and performance		Test assets and support	
Schedule (see fig X–1)	Concept of operations (see fig X–6)	Contractor testing (see fig X–12)	Production rep articles (see fig X–17)	Test team training (see fig X–22)	Packaging, handling and transportation (see fig X–28)
Requirements (see fig X–2)	TEMP (see fig X–7)	Developmental Testing (see fig X–13)	Interoperability & Compatibility (see fig X–18)	Personnel (see fig X–23)	Support Agreements/ Contractor Support (see fig X–29)
AoA (see fig X–3)	OT Event Design Plan (see fig X–8)	Live Fire Testing (see fig X–14)	Software Development (see fig X–19)	T&E Infrastructure (see fig X–24)	Threat Systems (see fig X–30)
STAR (see fig X–4)	Deficiency ID & Correction Process (see fig X–9)	System Performance (see fig X–15)	Safety Reviews & Certifications (see fig X–20)	M & S (see fig X–25)	Technical Data (see fig X–31)
Maintenance Concept (see fig X–5)	Security Planning (see fig X–10)	System Maturity (see fig X–16)	Deficiency Resolution (see fig X–21)	Support Equipment (see fig X–26)	CTSF Testing (see fig X–32)
	Configuration Management Plan (see fig X–11)			Sufficiency of Spares (see fig X–27)	Joint Interoperability Testing (if required) (see fig X–33)

X–3. Team effort
Since any risk reduction process is a team function, PMs must provide the right organizational structure and continuous motivation to make it effective. Risk is eliminated only when existing conditions that cause problems are changed. These changes will typically occur at levels not normally visible to senior decision-makers. This process should start at the earliest date possible but should then culminate by OTRR #1 (that is, 270 days prior to start of OT). The formal OTRR process (see para 6–45) will track any incomplete template.

X–4. Starting early
To be most effective, the development of OT entrance criteria must begin as early as practical after the initiation of a new program. Early on, the PM will use the templates grouped under **Test Planning and Documentation** (**Templates 1–11**). These templates look past the system itself to areas upstream in the acquisition process where earlier fixes to

problems generate large future paybacks. The **System Design and Performance** (**Templates 12–21**) focus on activities after Milestone B and before OT begins. The **Test Assets and Support** (**Templates 22–33**) helps ensure all required assets come together in preparation for OT.

X–5. Series of OTRRs

Entrance criteria are considered in a series of OTRRs culminating in a determination of readiness for OT. The T&E WIPT should decide how to structure each entrance criteria template for the program. The T&E WIPT should decide on the best forum for conducting the reviews. Some suggestions are using the T&E WIPT or, if the acquisition program warrants, forming a special OTRR group.

X–6. Frequency of reviews

PM, in coordination with T&E WIPT, should establish the schedule required to complete the templates. In general, the frequency of reviews should increase as the program approaches OTRR #1. Early in the development program, a year between reviews may be sufficient, but as OTRR #1 draws near, reviews could be spaced at 3 to 6 week intervals. As reviews proceed, PMs may find some templates are chronologically too early (or too late) to have immediate impact on a program. All templates and line items should be covered at each review to ensure adequate lead times are planned, to address requirements changes, and to correct past oversights. See table 6–3, Recommended OTRR dates.

X–7. Review

A thorough review of all system requirements and resource needs is the first step in assessing a program's readiness to begin OT. Each participant (subject matter expert) in the entrance criteria process should review assigned areas of responsibility and intensify ongoing efforts to reach unmet goals. Compare demonstrated system performance to required system performance, and compare available resources to required resources. A coherent, complete linkage should extend from system/program requirements down through the planned methods and resources for demonstrating technical and operational performance. Any flaws, inconsistencies, contradictions, voids, or disconnects are potential issues and areas of risk. Accurate and complete inputs are needed from all participants.

X–8. Assessment

The system evaluator, in coordination with the PM and operational tester, should next assess the shortfalls identified in the template review for impacts on the OT program. Per the OTRR agenda depicted in figure 6–7, candid assessments by the evaluator of the system's readiness for OT (the risk of not passing OT) are crucial to the success of the entrance criteria process.

X–9. Standard for judging readiness

Every template and template line item uses the same ideal standard for assessing system readiness for OT and risk level: "Will the system be ready for and successfully complete OT in this area?" The cumulative total of all judgments about these risks will indicate if the complete system is ready for OT. This candid assessment is the heart of the entrance criteria process.

X–10. Development of program goals

PMs must know what events or facts must occur to achieve program goals before OT starts. Empirical, performance-based capability should be developed for each identified deficiency or issue. Satisfaction of demonstrated system performance is the best means to ensure readiness for OT. If possible, make DT more operationally relevant to serve as a predictor of future operational performance. Value judgments backed up by sound technical and military judgment may also be necessary. Areas judged "not ready" will require explanation and an action plan to reach the program goals.

X–11. If standards are not met

Some template line items may not reach the "ideal standard" (for example, are not expected to be ready for OT) after close scrutiny. For example, technical manuals are often unavailable, produced late, or incomplete at the start of OT. A few unavoidable departures from the ideal standard are expected, yet these areas still require constant, long-term management attention. Acceptable limitations for certain areas of OT should be discussed. Negotiation of standards and action plans should occur.

X–12. Negotiation

Risk areas persisting after repeated reviews are likely to impact the conduct of OT. Entrance criteria participants must negotiate workaround plans and solutions, or agree to some limitations on OT. The program management office is the focal point for attaining negotiated consensus on managing risks. Workarounds and solutions must be in the best interests of the Army. Operational test officials must be satisfied that the robustness, objectivity, and independence of OT will not be compromised, while the program office must retain sufficient management flexibility to find optimal solutions. Again, sound military and technical judgments are required to reach a corporate Army decision to proceed

into OT. Both the system's PM and responsible T&E organization should maintain an appropriate resource management reserve in order to deal with assumed risks and the inevitable surprises associated with any significant T&E effort.

X–13. Reporting

The program management office or other T&E WIPT designated action officer is responsible for consolidating all participants' inputs and observations and preparing the entrance criteria briefing or report. Explicit corrective action plans should be developed for each deficient area.

X–14. Reporting final entrance criteria

The content and format of the templates are discretionary and should be tailored to fit the situation. The final product should be an executive-level review of the entire program conveying enough information for senior leadership to make informed judgments of system readiness for OT. The review must broaden senior leaderships' perspective to the "macro" level where overall program risk is assessed along with supporting details, if required.

X–15. Reporting to certifying officials

After reviewing the briefing or report, the PM will forward it to the OTRR chair who remains responsible for final entrance criteria of system readiness for OT. The PM will brief status of incomplete template action items at OTRR #2 (that is, 60 days prior to start of OT). Representatives from appropriate levels of the using command, OTA, and other participating organizations are required.

X–16. Tailoring the process

As early as practical, the PM, in coordination with the T&E WIPT, should tailor the entrance criteria process to their need for information. The review, assessment, negotiation, and reporting cycle should be repeated as often as necessary.

X–17. Templates not program specific

Since the templates are not program specific, PMs, in coordination with the T&E WIPT, may tailor them to fit specific programs or groups of programs. Some templates may require greater or lesser emphasis depending on the program and its phase of development. The templates allow maximum flexibility in focusing and structuring reviews without losing sight of the original objective—providing an executive-level review of the program.

X–18. Tailoring level of detail

PMs may attach additional information or levels of detail to the templates at their discretion. Some examples might be action plans, requirements thresholds, lists of acquisition regulations and standards, watch lists, breakdowns of specific line items, and points of contact. Additional templates can be developed to cover new areas. On the other hand, aggregation of templates and template line items can reduce redundancy and help managers concentrate on known risk areas. In short, tailor each entrance criteria program to attain the best results.

X–19. Joint and multi-Service programs

This entrance criteria process will be the primary entrance criteria method for all programs when the Army is the lead Service. For programs where the Army is not the lead, the results of this process should flow into the other Service's entrance criteria process.

X–20. Updating the templates.

The entrance criteria templates are expected to mature through feedback. Further changes will result from advanced technologies, improved T&E methods, revised acquisition procedures, and restructure of the DOD test infrastructure. All entrance criteria template CBTDEV/FPs should forward their observations and suggested improvements to TEMA. Feedback is essential to keep the process and templates up to date.

Section II
Template Structure

X–21. Interlocking matrix

The templates form a matrix of interlocking subject areas spanning an entire acquisition program. Each template introduces order and reduces risk in a specific segment or aspect of the acquisition program. Some duplication and cross-referencing between templates is necessary because acquisition programs rely on many overlapping disciplines. Decisions about risk in one area often affect other areas. Cross-referencing also facilitates broad area reviews as well as special subject area reviews.

X–22. Consolidation of multiple sources

Each template consolidates as much critical information as possible from multiple sources into a succinct "checklist." Programmatic and regulatory details are left to office of primary responsibility or others more thoroughly conversant with specific acquisition guidance. All information in each template is arranged chronologically as much as possible.

X–23. Answering template line items

Each template contains line items phrased as statements of fact rather than questions. Each line item should elicit a brief summary of program status in that subject area rather than a superficial "yes" or "no" response. The entire group of statements covers the template subject area, but further analysis may be required in certain cases. Line items may be answered individually or in groups depending on how the T&E WIPT has tailored the process. Each template can function as a "tailored checklist" and as a road map for future activities in preparation for OT. As a general rule, aggregation of line items should increase as the review rises up through the chain of command.

X–24. Focus on ends, not means

The templates emphasize "what must be done" rather than "how to do it." No specific problem solving methods are advocated over any other, leaving PMs maximum flexibility to implement their own "best practices." The templates focus on the ends rather than the means.

X–25. Assigning responsibilities

A single lead agent, or office of primary responsibility, is suggested for each line item on all templates to assist PMs and other participants in focusing responsibility and increasing accountability for results. Final determination of office of primary responsibility should be assigned as required to improve organizational efficiency, and should be based on who is best suited to complete each task or final product. Note that final approval authority for some line items may lie at higher levels. The suggested office of primary responsibility is a starting point and may vary by program. While other agencies are expected to participate on a collateral basis, multiple office of primary responsibility and offices of collateral responsibility are not listed since responsibility would be defocused, and not all variations between programs can be covered. Once identified and agreed upon, the office of primary responsibility must produce a high quality review in assigned areas and gain the required level of participation from offices of collateral responsibility. The PM, in coordination with the T&E WIPT, is responsible for ensuring that the system is ready for OT.

Note. Template legend:

C: Contractor
CBTDEV: Combat developer
CTSF: Central Technical Support Facility
FP: Functional proponent
OT: Operational tester
PM: Program/Project/Product manager
RTO: Responsible test organization
SE: System evaluator

TEMPLATE 1

Test Planning and Documentation

Schedule Template

1. Begin using the OT Entrance Criteria Process as early as possible to help identify all long-lead items and risk areas. (All)

2. Schedule sufficient numbers of entrance criteria reviews using the entrance criteria process. Frequency of reviews should increase as the program nears OTRR #1. (PM)

3. Resolve open issues, particularly with requirements, early enough to permit orderly planning and transition to OT. (PM)

4. Develop realistic, achievable acquisition and test schedules and ensure they are "harmonized" throughout all program documents. Avoid "success oriented" schedules. (PM and OT)

5. Check for congressional and PPBS schedule constraints and incorporate into the acquisition schedule. (PM)

6. Where "concurrent" testing is planned, ensure test planning starts early and that independent operational test objectives are not compromised. (OT)

7. Ensure availability of sufficient and timely RDTE funding and procurement appropriations during each budget cycle to keep the program in technical balance. (PM)

8. Conduct the final entrance criteria briefing a minimum of 30 days (if possible) prior to OTRR #1 to allow sufficient time to address any remaining issues. (PM)

Figure X–1. Schedule OT entrance criteria template

TEMPLATE 2

Test Planning And Documentation

Requirements *

1. The MNS must be current and support the latest Defense Planning Guidance (DPG). (CBTDEV/FP)

2. The MNS must be coordinated, validated, and approved at the appropriate levels. (CBTDEV/FP)

3. The MNS mission capabilities must accurately flow down (be linked) through the ORD, AoA, CONOPS, and TEMP to the OT concept and OT plan. (CBTDEV/FP)

4. The system must satisfy projected mission area deficiencies in the MNS and DPG before it is certified ready for OT. (PM)

5. The "strategy-to-task" and "task-to-need" framework in the Mission Area Assessment (MAA), Mission Needs Analysis (MNA), and the MNS must continue to support the preferred solution in the AOA. (CBTDEV/FP)

6. The system must provide the needed capabilities against the most current DIA-validated threat described in the STAR (or STA if a STAR is not available). (PM)

7. Possible joint, multi-national, or multi-Service uses described in the MNS must be addressed during the system's development. (PM)

8. The system must satisfy key constraints and boundary conditions relating to national-level defense planning and support identified in the MNS and DPG. (PM)

9. The ORD system characteristics and capabilities must satisfy each proposed concept in the MNS. (CBTDEV/FP)

10. The ORD must be coordinated and approved at appropriate levels prior to each Milestone, after major program changes, and sufficiently early to develop the OT test concept and plan. (CBTDEV/FP)

11. All capabilities, thresholds and objectives must be stated in operational terms and defined in measurable, beneficial increments of capability. (CBTDEV/FP)

a. Requirements should be stated in such a manner that "testable" MOEs/MOPs can be developed. MOEs must be quantitatively measurable through analytically based evaluation methods when possible. (CBTDEV/FP)

b. A Reliability Correlation Matrix (RCM) must be attached that accurately summarizes the system characteristics and capabilities described in the ORD. The RCM must be up-to-date and in the proper format. (CBTDEV/FP)

Figure X–2 (PAGE 1). Requirements OT entrance criteria template

12. All key performance parameters, (KPP) MOEs, threats, definitions, and other criteria must be consistent (harmonized) between the latest ORD, MNS, STAR, AOA, CONOPS, and APB. (CBTDEV/FP)

13. COICs are crosswalked to the test plan. (OT)

14. High-risk areas and potential problems must be identified prior to start of OT. (CBTDEV/FP)

15. The MATDEV, OT, and all using commands must review changes to the ORD. (CBTDEV/FP)

a. After MS B, the ORD should be modified only due to changes in the MNS or cost-schedule-performance trade-offs conducted during the system development and demonstration phase. (CBTDEV/FP)

b. Changes must be finalized early enough not to have adverse impacts on the successful completion of OT. (CBTDEV/FP)

c. Open requirements issues must be documented and resolved prior to start of OT. (CBTDEV/FP)

d. The ORD and RCM must contain a complete audit trail documenting rationale for all requirements changes, including changes from the APB. (CBTDEV/FP)

16. The C4ISP will capture the system characteristics and capabilities and must satisfy each proposed concept in the MNS/ORD, Joint Tactical Architecture (JTA), and Global Information Grid (GIG) Architecture. (PM)

17. The C4ISP must be coordinated and approved at appropriate levels prior to each Milestone, after major program changes. (PM)

18. The C4ISP CIO Assessment must be completed, submitted to the Army Chief Information Officer (CIO) for approval. (PM)

* Mission Need Statement (MNS), Operational Requirements Document (ORD), and C4I Support Plan (C4ISP)

Figure X–2 (PAGE 2). Requirements OT entrance criteria template—Continued

TEMPLATE 3

Test Planning and Documentation

Analysis of Alternatives (AoA)

1. The AoA (if required) must be updated, validated, and approved at the appropriate level prior to each Milestone. (CBTDEV/FP)

2. All reasonable alternatives must be objectively described. A preferred alternative and its military worth must be clearly identified. (CBTDEV/FP)

a. All relevant costs must be identified using objective engineering and business estimates. (PM)

b. All assumptions and constraints must be explicitly identified and supported by the latest MNS or ORD. (CBTDEV/FP)

c. Acceptable ranges of performance must be established using rigorous cost-benefit, trade-off, and sensitivity analyses to show decision makers at what points certain degradations in system cost or performance yield outcomes that no longer satisfy the mission need. (CBTDEV/FP)

3. Develop MOEs reflecting operational utility and show how they were derived from the MNS. (CBTDEV/FP)

a. MOEs at the operational task level must be "testable and measurable" in order to develop DT and OT test plans and concepts. MOEs must be developed as early as possible and agreed to between CBTDEV/FP and tester. (CBTDEV/FP)

b. MOEs, MOPs, and test criteria must be linked to system performance thresholds stated in the latest MNS and ORD and "track" throughout the program's development. (CBTDEV/FP)

4. As requirements are refined, threats evolve, and tactics change in the ORD, STAR, CONOPS, and maintenance concept (MC), incorporate these changes into the AOA and the OT plan. Ensure all requirements remain "harmonized" and current. (CBTDEV/FP)

5. Describe all databases and M&S assets used in the analysis. Ensure they are up-to-date and have undergone V&V before use in the AOA. In addition, ensure all data bases and M&S assets have undergone VV&A before use in OT. (CBTDEV/FP and OT) (See Template 25–M&S.)

Figure X–3. Analysis of Alternatives OT entrance criteria template

TEMPLATE 4

Test Planning and Documentation

System Threat Assessment Report (STAR)

1. The STAR* must remain valid and current with updates made prior to each milestone. (PM)

2. Army must approve the STAR. For ACAT I programs, it must be validated by DIA. (PM)

3. The STAR must be consistent with current DOD projections and "harmonized" with the threats listed in the MNS, ORD, and AOA. (PM)

4. Program objectives from the ORD must be accurately summarized in the STAR. (PM)

5. Sufficient threat detail must be provided to support system R&D and the development of realistic operational mission scenarios in support of the OT plan and schedule. (PM and CBTDEV/FP)

a. All threats must be described in system-specific terms. (PM and CBTDEV/FP)

b. Threat "shot doctrine" and employment tactics must be described. (PM and CBTDEV/FP)

c. The "reactive" threat and potential countermeasures must be described. (PM and CBTDEV/FP)

d. Sources for projections and areas of uncertainty must be cited. (PM and CBTDEV/FP)

* This template refers equally to the System Threat Assessment (STA) as well as the STAR.

Figure X–4. System Threat Assessment Report OT entrance criteria template

TEMPLATE 5

Test Planning and Documentation

Maintenance Concept (MC)

1. The MC must describe the optimal system maintenance strategies, concepts, and methods based on the suitability requirements in the MNS and ORD. (CBTDEV/FP, logistician)

a. The MC must be consistent with the using command's and Army logistics support plans and infrastructure. (CBTDEV/FP and logistician)

b. The system must use an acceptable inter-service, organic, and/or contractor mix. (CBTDEV/FP and logistician)

c. The MC must identify potential high-risk areas and problem areas (such as poor integrated diagnostics, software failures, and data integrity). (CBTDEV/FP and logistician)

d. Limitations and work-around must be identified. (CBTDEV/FP and logistician)

2. Logistics and readiness MOEs, criteria, thresholds, objectives, and definitions in the MNS and ORD must accurately flow down (be linked) to the MC, which must in turn be linked to the OT concept and plan. (CBTDEV/FP and logistician)

3. The strategies and plans in the MC must be sufficiently detailed to support early development of the OT concept and OT plan. (CBTDEV/FP and logistician)

4. Realistic suitability test scenarios for DT must be developed from the MC and be consistent with the CONOPS. (PM)

5. MC must be considered in developing realistic OT test scenarios. (OT and logistician)

6. The MC's strategies and plans for the system will examined in OT. (PM and OT)

a. DT must demonstrate the system is viable and supportable according to the MC and ready for OT. (PM and logistician)

b. The system must demonstrate the capability to satisfy each of the elements of operational suitability and ILS elements found in AR 700-127. (PM and logistician)

c. The system's design must successfully address the quantitative and qualitative constraints identified in the MC. (PM and logistician)

7. System maturity, logistics support, available resources, and personnel must be sufficient to support the MC and maintenance plan during OT. (See Template series under Test Assets and Support) (OT and logistician)

Figure X–5. Maintenance Concept OT entrance criteria template

TEMPLATE 6

Test Planning and Documentation

Concept of Operations (CONOPS)

1. The CONOPS must describe optimal system employment methods and tactics and be based on the operational requirements in the latest MNS and ORD. (CBTDEV/FP)

a. CONOPS must be considered in developing the OT concept and OT plan. (OT)

b. The CONOPS must be sufficiently detailed to permit early development of operationally realistic test scenarios and tactics for the OT test concept and test plan. (CBTDEV/FP)

2. Operational effectiveness requirements, criteria, thresholds, objectives, and definitions in the MNS and ORD must accurately flow down (be linked) to the CONOPS, which must in turn be linked to the OT test concept and OT plan. Changes in the MNS, ORD, STAR, AOA, maintenance concept (MC), and TEMP must be analyzed for potential impacts on the CONOPS, which in turn affect the OT plan. (CBTDEV/FP)

3. Realistic test scenarios

a. CONOPS consistency with the MC will be examined in DT. (PM)

b. CONOPS consistency with the MC will be examined in OT. (OT)

4. The system must demonstrate readiness for OT in its intended operational environment using the CONOPS strategies and plans. (PM)

a. The system must clearly demonstrate in DT the potential to perform the roles, missions, and tasks described in the CONOPS. (PM)

b. The system's design must successfully address the quantitative and qualitative constraints identified in the CONOPS that impact system performance in OT. (PM)

Figure X–6. Concept of Operations OT entrance criteria template

TEMPLATE 7

Test Planning and Documentation

Test & Evaluation Master Plan (TEMP)

1. The T&E WIPT or other designated forum must review the status of system entrance criteria for OT as directed by the certifying official. (PM)

2. The TEMP must be updated, coordinated, and approved at appropriate levels prior to each MS and after major program changes. (PM)
a. Open issues must be addressed. Changes required by OSD or other decision authorities must be incorporated as agreed. (PM)
b. Coordination must be timely and efficiently planned to minimize chances of late rejection and negative impacts on OT. (PM)

3. The TEMP must be accurately "harmonized" with the most recent ORD and STAR. (PM)

4. The APB and ADM must be reviewed to ensure new directions, requirements, and critical technical parameters are included in the TEMP as appropriate. (PM)

5. The TEMP must establish clear relationships between 1) test management strategy and structure, program schedule, and required resources, and 2) performance requirements, COICs, critical technical parameters (CTPs), evaluation criteria, and MS decision points. (PM)
a. The OT program must be executable in terms of structure, schedule, and resources. (OT)
b. OT test resource shortfalls or limitations potentially impacting OT must be identified and discussed in the TEMP. (SE and OT)
c. Describe the M&S assets to be used in OT. Ensure they undergo VV&A and their use is approved. (See Template 25—M&S) (OT)
d. If LFT is required, include the LFT strategy in the TEMP. (PM)
e. The sources of all technical parameters/requirements must be documented. (PM)

6. The TEMP must describe what DT, OT, or combined DT/OT will do to ensure the system has the potential to meet all CBTDEV/FP requirements. (PM)
a. Show how all critical issues and MOEs will be addressed in OT. (OT)
b. Proposed work-around (to include contractor involvement) must be sound, feasible, and consistent with national policy. (PM)

7. Rationale and provision must be made for any testing deferred past OT into FOT&E and a plan for accomplishment provided. (PM)

8. Requirements/Test Crosswalk Matrix (attachment 1 to TEMP). (PM/OT/CBTDEV)
a. The purpose of the Requirements/Test Crosswalk Matrix is to provide a linkage among the AoAs, MOE, MOS, KPP, COI, and CTP, and then relate these items to specific test events for identification of data necessary to evaluate the system against the requirements. This crosswalk matrix will consist of a foldout spreadsheet or matrix, as shown in appendix D, figure D-2, this pamphlet. (PM/OT/CBTDEV)
b. The linkage can be developed using any one of the categories to generate the association. (PM/OT/CBTDEV)
c. Since the COI are usually the fewest in number, it may be easiest to begin with the COIC and then develop the linkage with the other categories. The MOE/MOS column should reflect precisely the MOE/MOS table contained in Part 1 of the TEMP. The CTP column should also reflect precisely the CTP matrix in Part 1 of the TEMP. (PM/OT/CBTDEV)
d. The second part of the matrix should consist of all test events contained in the test strategy. For each test event, an "x" is placed in a box, provided data from that test will be used to satisfy the corresponding requirement. (PM/OT/CBTDEV)

Figure X–7. TEMP OT entrance criteria template

TEMPLATE 8

Test Planning and Documentation

Operational Test Event Design Plan

1. The OT test concept must be developed and briefed as early as feasible. (OT)
a. The OT concept must describe the characteristics of the operational and maintenance environments and test scenarios the system will encounter in OT. (OT)
b. After OT concept review, the DT program must be made sufficiently rigorous to ensure CBTDEV/FP requirements can be met or exceeded in these environments. (PM)
c. Ensure T&E WIPT meetings are scheduled and structured to add value to the OT through better MS reviews and entrance criteria briefings. (PM)

2. The OT Event Design Plan (EDP) must be developed and coordinated as early as feasible at appropriate levels. If an OSD T&E oversight program, OSD/DOT&E approval of test plan adequacy is required. (OT)
a. Prior to T-120 days the OT EDP must be provided to review and approve the plan. (OT)
b. Does the Baseline Correlation Matrix (BCM) and its MOEs/MOPs have clearly defined links with the MNS and ORD (SE).

3. A phase of rigorous, OT must be planned with sound T&E methodologies evident throughout. (OT)
a. Sufficiently realistic testing must be planned under the specified operational environment from the OMS/MP and other documents. (OT)
b. Open issues and disconnects (such as with test methodologies, requirements, and MOEs) must be resolved. (OT)
c. Definitions, formulas, models, scenarios, and evaluation criteria must be standardized as much as possible between the DT and OT plans. (OT)
d. M&S assets planned for OT should be as consistent as possible with the M&S assets used in the AOA and the DT. (See Template 25—M&S) (OT)

4. All resource requirements in the Outline Test Plan (OTP) (M&S support, test articles, training, fault analysis and, contracting) must be identified. (See Template series under Test Assets and Support.) (OT)

5. A program with combined DT/OT must ensure the following:
a. None of the DT or OT test objectives are compromised as a result of joint/combined testing. (OT)
b. DT data and formats are useable in OT as much as possible. (OT)
c. Test item configurations are rigorously controlled according to plan. (See Template 11—Configuration Management Plan.) (PM)
d. Duplication and gaps in testing are minimized. (OT)
e. A prudent number of backup resources (test assets and funds) are available to supplement OT if planned DT data is unusable or unavailable. (PM)

6. Describe all OT test limitations for example, lack of test resources, time, system capabilities, insufficient realism that may impact the Milestone C decision. (OT)
a. Describe how these test limitations will be addressed in FOT&E and beyond. (OT)
b. Detailed test procedures must be developed and provided to the PM. Test procedures should be dry run. (OT)

Figure X–8. OT Event Design Plan entrance criteria template

TEMPLATE 9

Test Planning and Documentation

Deficiency Identification and Correction Process

1. A contractor-owed and contractor-based deficiency reporting system must be established and provide useable information and inputs to the Government's deficiency reporting system. (C)

2. A Government-run deficiency reporting system must be established for promptly identifying and accurately reporting system/materiel deficiencies. (PM)

3. When, during testing, test incident reports identify materiel/system deficiencies the information should be utilized and inputted to the deficiency reporting system. (RTO)

4. A review board must ensure that disposition instructions are provided to resolve all deficiency reports and list the impacts to operational testing. (PM)

5. A review board will review, validate, and prioritize all deficiency reports in a manner that is timely and responsive. (PM)

6. A failure reporting and corrective action system or similar system must be established. It will be used as a closed-loop process for identifying and tracking root failure causes including design errors, part problems, workmanship defects and/or process errors, and subsequently determining, implementing, and verifying an effective corrective action to eliminate their re-occurrence. (PM)

7. Reliability, availability, and maintainability (RAM) scoring and assessment conferences will be established to review all RAM data and to develop the procedures to be utilized for the conferences. (SE)

8. Assure the contractor and the T&E WIPT has been apprised as to the level of involvement and participation the contractor will have in the scoring/assessment conferences. (PM)

9. Any remaining deficiencies that remain open from developmental testing and are still being considered for corrective actions or requiring disposition instructions must not preclude the successful conduct of operational testing and the evaluation or assessment of the achievement of operational requirements. (PM)

Figure X–9. Deficiency identification and correction process OT entrance criteria template

TEMPLATE 10

Test Planning and Documentation

Security Planning

1. Identify security constraints and their impacts on OT. Develop work arounds where possible. (OT)

2. The system operations security (OPSEC) plan must be current and systems engineering security requirements accomplished. (PM)

a. Identify and resolve any disconnects between service and system Security Classification Guides (SCG). (PM)

b. Ensure secure communications and/or frequencies (if required) are in place to support system-level DT and OT. (PM or OT)

c. Ensure data encryption and encoding devices are available (if required). (PM)

d. Ensure security measures and requirements (such as, telecommunications electronics materiel protection from emanating spurious transmissions (TEMPEST) and high-altitude electromagnetic pulse {HEMP}) are accomplished and current. (PM)

e. Ensure test ranges or facilities have security planning, procedures, and personnel documented, in-place, and implemented. (OT)

3. The system's SCG and Program Protection Plan must be current. Ensure computer system security protection measures are accomplished and current. (PM)

4. Security clearances and required security training for test team personnel must support the OT plan and schedule. (OT)

Figure X–10. Security planning OT entrance criteria template

TEMPLATE 11

Test Planning and Documentation

Configuration Management (CM) Plan

1. A system configuration control mechanism must be in place for all system components and support items (for example, hardware, software, support equipment, and GFE). (PM) (See Template 17—Production Representative Articles.)

a. A Configuration Management Plan and configuration baselines must be used to ensure an orderly transition from one MS decision point to the next. (PM)

b. The Government must have sufficient control or oversight over the configuration to ensure the results of OT are not invalidated. (PM)

2. The exact system configuration must be traceable throughout the program. The PM must also ensure that the capability exists to assess any configuration differences between pre-production and production test articles. (PM)

3. If known deficiencies remain in test articles before start of OT, the Configuration Management Plan must describe strategies for managing the following areas: (See Template 21—Deficiency Resolution.)

a. System form, fit, and function must not be adversely affected as a result of each deficiency. (PM)

b. The impacts of fixing before versus after OT must be assessed. (PM)

c. Additional testing needed to verify correction of deficiencies must be identified. (PM)

d. The system configuration will be stable and production representative before the start of OT. (PM)

4. Identify in the plan any system development or maturity issues that negatively impact the OT plan and schedule in support of the next milestone review. (PM)

5. Certify that the start of full-rate production will not invalidate OT results due to changes in or termination of any quality control procedures or mechanisms (such as environmental stress screening) used during pre-production. (PM)

Figure X–11. Configuration Management Plan OT entrance criteria template

TEMPLATE 12

System Design and Performance

Contractor Testing

1. Ensure all system specifications and contractor requirements reflect the latest ORD changes. Late ORD changes may not be practical to reflect in the system spec. (PM)

2. A comprehensive test plan for contractor development, qualification, and production acceptance testing must be in place. (C)

a. The plan must minimize overlaps and gaps and collect maximum information from every test event. (C)

b. Requirements and specifications must flow down accurately and clearly from prime contractors to subcontractors. (C)

c. Test methods selected must determine if all aspects of the capabilities, performance-based specification and CBTDEV/FP requirements can be met. (C)

d. Multiple test events should be performed under varying conditions to demonstrate specification compliance. (C)

e. Sub-system and system pass/fail specification thresholds must be directly traceable to the stated operational capabilities in the latest ORD. (PM)

f. A realistic (attainable) event-driven test schedule must be proposed and funded. (C)

3. Contractor testing must demonstrate that the system and/or components are performing as planned at each step in development. Government engineering analysis should determine if test results support achievement of the spec and if the system is projected to meet operational requirements. (PM and C)

4. Ensure contractor personnel will not be involved in OT except where permitted by law. (See Template 29—Support Agreements and Support Contractors.) (OT)

5. Periodic reviews should be made of available government facilities with the goal of using them in contractor testing wherever cost-effective and feasible. (PM)

6. A deficiency identification, tracking, and correction system must be in place to monitor test failures. (See Template 9—Deficiency ID and Correction Process.) (C)

a. All test failures and resultant system design changes must be documented and analyzed. Tests must be repeated as necessary to verify specification compliance. (C)

b. Document all changes to specification threshold (pass/fail) values and rationale. (PM)

c. Government review must continually monitor for impacts on DT and OT. (PM)

7. Planned contractor testing must be completed according to the contract specification before government acceptance and OT. Contractor testing deferred past government acceptance of the system should be documented and approved in the TEMP. Impacts to DT and OT must be documented. (PM and C)

Figure X–12. Contractor testing OT entrance criteria template

TEMPLATE 13

System Design and Performance

Developmental Testing (DT)

1. System requirements in the ORD must accurately flow down through the contract specifications and be demonstrated during DT. (PM)

2. When design-cost-performance trade-offs are made that may not meet CBTDEV/FP requirements/capabilities, CBTDEV/FP concurrence must be obtained and documented. (CBTDEV/FP must document in ORD and RCM.) (PM)

3. The DT schedule and testing must be planned and executed to allow sufficient time to certify system readiness for OT, start OT, and complete OT before MS C. (PM and OT)
a. DT must demonstrate that system design is complete and acquisition risks have been minimized. (PM)
b. DT must validate that contractor testing is complete, or that a plan exists to finish testing. (See Template 12—Contractor Testing.) (PM)
c. The results of DT indicate the system will perform successfully in OT and will meet MS C approval criteria. All specified technical thresholds have been met. (RTO)
d. Sufficient suitability tests must be conducted to permit credible predictions about RAM. All suitability thresholds have been assessed as achievable. (RTO)

4. A government-run DR system must be in place in support of DT and OT for identifying, tracking, and reporting deficiencies. (PM) (See Template 9—Deficiency ID &Correction Process.)

5. The government must be in control of a system configuration tracking and control process during DT that will support OT. The system design must be finalized with no major changes planned prior to OT. (See Template 17—Production Representative Articles) (PM)

6. Sufficient operationally relevant DT must be done, culminating in a "dress rehearsal" in the final phase of test, to determine if operational requirements can be met before OT. Sufficient interoperability and compatibility testing with other systems must be done. (See Template 18—Interoperability and Compatibility.) (PM and RTO)

7. LFT (if required) must be complete before start of OT, or a waiver approved prior to MS B. (See Template 14—Live Fire Testing.) (PM)

9. For combined T&E, minimize duplication and gaps in testing and the use of facilities. Data formats used in DT and OT must be compatible to maximize availability and usability of data. (See Template 8—OT Event Design Plan.) (OT)

10. An agreed-upon plan and rationale must exist (for example, in the TEMP) for testing any areas or capabilities deferred past the start of OT. If there are any incomplete test areas, explain why and give impacts on OT. (PM and RTO)

11. Ensure sufficient interim DT results and conclusions are available to support entrance criteria of readiness for OT. (RTO)

Figure X–13. Developmental Testing OT entrance criteria template

TEMPLATE 14

System Design and Performance

Live Fire Testing (LFT)

1. Per the annual OSD T&E Oversight List, determine if the program is a live fire covered system. Review the most current requirements, threats, and operational scenarios in the MNS, ORD, STAR to determine if the system is a "covered system." OSD concurrence is required. (PM)

2. If LFT is required (for a covered system), it must be completed before start of OT or a LFT waiver approved before Milestone B. (PM)

3. If LFT is required, determine LFT scope and complete a cost-benefit analysis. (PM)

a. If LFT is determined to be cost-effective and will be accomplished, include a LFT strategy in the TEMP and prepare a LFT plan for OSD comments. (PM)

b. Provide a LFT report to OSD for comments and before entrance criteria for OT. (PM)

4. If LFT is determined not to be cost effective, prepare a LFT waiver request package with an alternate plan for vulnerability/lethality testing for HQ ARMY and OSD approval before Milestone B (PM)

a. Include the alternate vulnerability/lethality testing strategy in the TEMP. (PM)

b. Provide the alternate plan to OSD for comments. (PM)

c. Provide a vulnerability/lethality test report to OSD for comments and before entrance criteria for OT. (PM)

5. Deficiencies identified during LFT that are to be corrected must be tracked and retested prior to entrance criteria for OT. (PM)

6. Fully comply with all system-specific congressional direction regarding LFT. (PM)

Figure X–14. Live fire testing OT entrance criteria template

TEMPLATE 15

System Design and Performance

System Performance

1. The system must demonstrate credible potential of meeting operational effectiveness and suitability requirements in its intended operational environment using operationally relevant scenarios. (PM)

a. The system must demonstrate that it has credible potential to perform successfully in OT (meet CBTDEV/FP requirements) and will meet Milestone C approval criteria. (PM)

b. Areas of system effectiveness and suitability must be reviewed against requirements (MOEs, MOPs, thresholds, objectives, and other test criteria). (PM)

2. System T&E must demonstrate that known design problems have been corrected or resolved. (See Template 21—Deficiency Resolution.) (PM)

a. Any remaining problem areas must have minimal impact on the outcome of OT. (PM)

b. Fixes must be identified for all problems deferred past the start of OT into FOT&E. (PM)

3. Is the software sufficiently mature to ensure acceptable hardware and software integration. (PM)

4. System integration problems must be corrected to allow operators to satisfy mission requirements. The system must be ready for system or mission-level testing. Integration among system components and subsystems must optimize total system design and performance capabilities. (PM)

5. If planned certification of the system is to occur in increments of increasing capability (maturity), describe what capabilities are lacking at this time. (PM)

6. LFT (if required) must be complete and achieve required (acceptable) levels of system survivability or lethality. (See Template 14—Live Fire Testing.) (PM)

Figure X–15. System performance OT entrance criteria template

TEMPLATE 16

System Design and Performance

System Maturity

1. Interim (block, P3I, evolutionary) as well as final objective requirements for system and sub-system components (to include support equipment) should be stated in the ORD and reliability centered maintenance. Target dates for these maturity levels should be provided. (CBTDEV/FP)

2. Interim values for system and sub-system level components (to include support equipment) might be available and transferred into the performance-based specification. (PM)

a. A reliability growth plan must be developed and coordinated. (PM)

b. Identify any system development and/or maturity aspects impacting the ability to start and complete OT in time to support Milestone C. (PM)

3. The system's development progress must adhere to any specified interim and/or mature values and schedules. (PM)

a. DT must demonstrate the system is on track (expected to meet interim and/or mature values at the specified maturity levels) to be certified ready for OT. (PM)

b. Any constraints precluding the system from meeting interim and/or mature requirements during OT must be assessed. (PM)

4. System configuration to include software maturity must be carefully controlled as the system matures. Identify differences between the OT configuration and the production configuration, to include an assessment of potential impacts on the validity of OT. (See Template 11—Configuration Management Plan.) (PM)

5. Efforts should be made to improve hardware/software problem identification and isolation and increase the accuracy of determining problems with less incidents of false indications of problems. (PM)

Figure X–16. System maturity OT entrance criteria template

TEMPLATE 17

System Design and Performance

Production Representative Articles

1. Articles (to include support equipment, software, GFE) must be as production-representative as possible and available in the required quantities to support the OT plan and schedule. (PM)

2. A system configuration control mechanism must be in place for all system components and support items (for example, hardware, software, support equipment, and GFE). (PM)

a. The Government must have sufficient control or oversight over the configuration to ensure the results of OT are not invalidated.) (See Template 11—Configuration Management Plan.) (PM)

b. The exact system configuration must be traceable throughout the program. (PM)

3. Ensure the design is compatible with factory production procedures. (PM)

4. If known deficiencies remain in test articles (See Template 21—Deficiency Resolution.) —

a. Certify how form, fit & function are affected as a result of each deficiency. (PM)

b. Assess the impacts of fixing before versus after OT. (PM)

c. Identify additional testing needed to verify correction of deficiencies. (PM, SE, and OT)

5. Certify that the start of rate production will not invalidate OT results due to changes in or termination of any quality control procedures or mechanisms (such as environmental stress screening) used during pre-production. (PM)

6. Identify any system development or system maturity issues that negatively impact the OT plan and schedule or support the next MS review. (PM)

7. Other systems and subsystems required to interoperate with the test articles (including external systems) must be available to permit testing in an operationally realistic manner. (OT)

a. A process must be in place to manage system integration with other required systems and subsystems. (PM)

b. Ensure embedded test instrumentation is "invisible" to system performance and operators. (PM)

Figure X–17. Production representative articles OT entrance criteria template

TEMPLATE 18

System Design and Performance

Interoperability & Compatibility

1. The system must be interoperable and compatible with other systems as required in the MNS, ORD, and/or by DISA. (PM)

a. The system's performance must not be degraded when operated with other systems during OT and in the intended operational environment. Likewise, the system must not degrade the performance characteristics of other systems beyond the limits stated in the ORD. (PM)

b. Quantify how much degradation (or enhancement) will result in other interoperable systems' performance characteristics when the system is deployed. (PM)

2. Data passed to and from other independent and interoperable systems must be compatible. (PM)

3. For C4I systems (most are considered joint)—

a. Interface control documents are needed with affected agencies to establish data exchange formats, and communication protocols. (PM)

b. Check for status of Tactical Data Link (TDL), United Stated Message Text Format (USMTF) & Variable Message Format (VMF) and standards interoperability). (PM)

c. Obtain DISA and JITC joint interoperability entrance criteria as required. (PM)

4. Ensure compliance with the Army Electromagnetic Compatibility Program and Radio Frequency Spectrum Management guidelines. Assistance available at EPG and HQDA CIO Spectrum Directorate. (PM)

5. Conduct intra-Army, interoperability testing at CTSF and receive CIO/G6 interoperability and compatibility certification. (PM)

6. Other systems and subsystems required to interoperate with the test articles (including external systems) must be available to permit testing in an operationally realistic manner. (OT)

a. A process must be in place to manage system integration with other required systems and subsystems. (PM)

b. Ensure embedded test instrumentation is non-intrusive to system performance and operators. (PM)

Figure X–18. Interoperability and compatibility OT entrance criteria template

TEMPLATE 19

System Design and Performance

Software Development

1. System functionality and maturity must be developmentally tested at the system level prior to the start of OT. (PM)

2. Define software-related exit criteria at MS B. These criteria may be modified and/or criteria added as appropriate during system development. (PM)

3. Develop and implement a "requirements traceability" metric to measure the adherence of the software products (to include design and code) to the ORD requirements (for S/W Blocking functionality). (PM)

4. System level integration testing of software and hardware-software-firmware interfaces must be monitored, documented, and complete. (PM)

5. Ensure interoperability requirements are met by verifying software interfaces are operational. The software must be tested at the unit, integration, and system levels, and if the software is modified, adequate regression testing must be done. (See Template 18—Interoperability and Compatibility) (PM))

6. Known software and firmware discrepancies affecting system performance or the OT must be properly documented and appropriate corrective action(s) taken. (PM)

7. Sufficient regression testing must be done at the unit, integration, and system levels to ensure any changes do not result in additional defects. (PM)

8. Ensure the Government has an effective software configuration management and control system and control procedure in place. (See Template 11—Configuration Management Plan) (PM)

9. Software manuals (Software CBTDEV/FP's Manual(s), Software Programmer's Manual, Computer System Operator's Manual, Firmware Support Manual, and Computer System Diagnostic Manual) must be validated and up-to-date with the current software blocking baseline. They must be sufficient to support OT. (PM)

10. Software baseline configurations and firmware configurations must be fully documented and "frozen" before starting OT. No unilateral decision to make software changes will occur after OTRR #2. (PM and OT)

11. The software must be stable (operate error free for a reasonable length of time prior to OT). (PM)

12. The software must be certified (security, flight safety, and nuclear weapons) for operational use as appropriate. (PM)

13. Government facilities, tools, and manpower must adequately support fielding of the software if the MC requires the Government to maintain the software. (PM)

14. Contractor software support (if required for the fielded system) must be representative and available to support the OT plan and schedule. (PM)

Figure X–19. Software development OT entrance criteria template

TEMPLATE 20

System Design and Performance

Safety Reviews and Certifications

1. The system must be capable of being safely operated and maintained during OT and in its intended operational environment. (PM)

2. All catastrophic and critical hazards (Category I and II) must be addressed through the Safety Review Board and closed before the start of OT. (PM)

a. The CONOPS and MC must be reviewed, and safety constraints and limitations addressed. (PM)

b. Perform a Health Hazard Assessment to minimize risks during OT. (PM)

c. Review OSHA, State, and Army hazardous waste regulations for compliance. (PM)

d. Environmental impacts must be identified, mitigated, or neutralized. (PM)

3. Validated technical, safety, and procedural manuals must be available to support the OT plan and schedule. (PM)

4. Operator and maintenance personnel must have safety training completed in time to support the OT plan and schedule. (OT)

5. Formal entrance criteria for OT may be required from the following boards (PM) -

- Non-nuclear Munitions Safety Board
- Conventional Munitions Board
- Flight Safety Board
- Airframe Entrance criteria
- Range Safety
- Directorate of Nuclear Safety

6. Obtain operational flight waivers for systems requiring safety/flight release from aircraft. (OT)

Figure X–20. Safety reviews and certifications OT entrance criteria template

TEMPLATE 21

System Design and Performance

Deficiency Resolution

1. All deficiencies must be promptly and accurately reported and tracked. (PM)

2. Known deficiencies or capabilities deferred past the start of OT must be reviewed and prioritized by a DR review board and an impact analysis performed. (PM)

a. Category I and II deficiencies having impacts on OT or any COI must be fixed and closure verified according to an agreed upon plan. (PM)

b. Ensure OT can be completed as planned and results will not be invalidated due to deferred deficiencies. (PM)

c. Assess any synergistic relationships between deficiencies for impact on OT. (PM)

d. Deficiencies should be rank-ordered, and the most critical worked first or as agreed to by the CBTDEV/FP(s) and RTO(s). (PM)

e. CBTDEV/FP and RTO concurrence is required in the rank ordering. (CBTDEV/FP)

3. The deficiency analysis process must be complete and coordinated with CBTDEV/FP and testers prior to the start of OT. (PM)

4. If some deficiencies cannot be corrected or resolved prior to start of OT, develop a plan for testing deferred capabilities and fixes after OT is done. Define the scope and content of software and hardware releases planned after completion of OT. (PM)

5. System form, fit, and function must not be affected if OT is conducted with any known deficiencies. (See Template 17—Production Representative Articles.) (PM)

Figure X–21. Deficiency resolution OT entrance criteria template

TEMPLATE 22

Test Assets and Support

Test Team Training

1. OT test team training requirements and assets must be identified early and in sufficient detail. For joint and combined systems, additional joint/combined training requirements must be identified. (OT)

2. Required training must be adequately contracted for, funded, and scheduled to assure completion at the times required in the OT plan and schedule. (PM and OT)

a. Software maintenance training must be completed for OT evaluators if the software maintenance concept is for the Government to maintain the software. (PM)

b. OT test player personnel must be certified proficient in their respective skills before the start of OT. (OT)

c. Training must include normal and emergency operations to operate and maintain the system(s) according to the CONOPS and MC. (PM)

3. Exercise all test procedures in a pilot test, to include an end to end data run, before start of OT. (OT)

Figure X–22. Test team training OT entrance criteria template

TEMPLATE 23

Test Assets and Support

Personnel

1. Identify OT test player personnel requirements, including software maintenance skills and security clearances. Number of personnel and skill levels must be representative of the field (reflect the operational environment). (OT)

2. Written procedures must be available for test team personnel. (OT)

3. Written agreements must be in place establishing the sources for required personnel. (OT)

4. Estimates of maintenance requirements (in terms of person hours and personnel) for LRUs, subsystems, and the full system must be available. (PM)

5. Contractor support (ICS and CLS) must be identified.* (PM)

6. Required training must be completed or scheduled for completion to support the OT plan and schedule. (See Template 22—Test Team Training.) (PM)

* ICS Integrated Contractor Support
CLS Contractor Logistical Support

Figure X–23. Personnel OT entrance criteria template

TEMPLATE 24

Test Assets and Support

T&E Infrastructure

1. Resources and funding must be approved to start and sustain a credible OT program. (PM)

2. Test ranges (both indoor and outdoor) and other test facilities must be properly equipped, manned, funded, scheduled, and personnel briefed before start of OT. (OT)

3. Realistic targets (or validated target simulators) must be in the most current operational configuration(s) and available in sufficient quantities. (PM and OT)

4. Sufficient threat densities, either in open-air or indoor facilities, must rigorously stress the system in as realistic a combat environment as possible. (See Template 4—STAR and Template 30—Threat Systems.) (OT)

5. Adequate test instrumentation and data reduction capabilities must be identified, funded, scheduled, and support agreements negotiated on use rates and data requirements. (OT)

6. Modeling and simulation assets (including simulators, test drivers, and scenarios) must be VV&A scheduled, and available to support the OT plan and schedule. (OT)

7. Use the appropriate "test process" (that is, EC Test Process) if available. (PM and DT)

8. Identify T&E infrastructure shortfalls in the TEMP and inform Army TEMA. (PM)

9. An EIS (if required) addressing all Federal, State, Army, and local restrictions must be completed and approved, or waivers granted. (RTO)

Figure X–24. T&E infrastructure OT entrance criteria template

TEMPLATE 25

Test Assets and Support

Modeling and Simulation (M&S)

1. Develop an M&S plan for the system linking M&S requirements throughout the program (from the AOA through the Milestone C decision). (PM)

a. Show how proposed M&S resources support the program by linking them directly to requirements and the AOA. (PM)

b. M&S requirements, including interfaces with other systems, must be identified and included in the TEMP. (PM)

c. M&S assets should be usable by both the DT and OT test teams. The OT team should receive adequate training in their use. (PM)

d. Definitions, formulas, and evaluation criteria used to determine operational effectiveness and suitability must be consistent between DT and OT. (OT)

e. The system's M&S support requirements (to include the system life cycle) must be identified as early as possible. A life cycle plan must be developed for ownership and maintenance of M&S assets after system deployment. (PM)

2. An M&S VV&A plan must be developed with a comprehensive schedule that supports the OT plan and schedule. (OT)

a. Scenarios, test tools, and analysis tools required for testing must be adequately documented. (PM)

b. M&S assets must be VV&A independently of the developer and CBTDEV/FP before use in OT. Key assumptions (threats and tactics) must also be VV&A. (OT)

c. The design engineering notebook data must be reviewed. Physics models can be V&V, whereas operations analyses are subjectively V&V. Empirical test data should be used to establish model credibility. (PM)

d. The correct M&S accreditation agent must be used. (OT)

3. Establish M&S documentation and audit trail. (PM)

4. If M&S will generate results used to support or influence major decisions, OSD/DOT&E must approve their use in OT. (OT)

Figure X–25. Modeling and simulation OT entrance criteria template

TEMPLATE 26

Test Assets and Support

Support Equipment

1. Peculiar, common, and unique* support equipment (SE) must be identified as early as feasible. (PM)

2. Peculiar SE and its required support (technical data, spares, etc) must meet the maintenance times and capabilities stated in the ORD. (See Template 15— System Performance.) (PM)

a. Peculiar SE must be available in required quantities to support the OT plan and schedule. (PM)

b. Peculiar software SE and its supporting technical data, compilers, manuals, etc., must be available if the Government maintains the software. (PM)

3. Peculiar SE must be in production representative configurations and fully interoperable and compatible with the system(s) it supports. (See Template 17—Production Representative Articles.) (PM)

a. Assess any configuration differences between pre-production and production peculiar SE and the expected impact on the validity of OT. (PM)

b. The Government must have positive control or oversight over SE configurations. (PM)

4. Common SE must be identified and available in the required quantities to support the OT plan and schedule. (CBTDEV/FP)

5. Unique SE must be identified and available in the required quantities to support the OT plan and schedule. (PM)

6. SE training must be accomplished or scheduled to support the OT plan and schedule. (PM)

* **Peculiar SE.** SE under development in support of the system being tested.
Common SE. Fielded SE that supports existing systems used in OT.
Unique SE. Contractor or Government furnished SE for RDT use only.

Figure X–26. Support equipment OT entrance criteria template

TEMPLATE 27

Test Assets and Support

Sufficiency of Spares

1. Sufficient spares must be available to support test assets, test scenarios, and SE according to the OT plan and schedule. Support levels must be based on the total number of expected operating test hours. (PM)

2. Spares repair procedures and capabilities (for blue suit and/or CLS, if required) must be in place to support the OT plan and schedule. (PM)

3. Provision must be made for timely failure confirmation and repair action reports to the OT test team. (PM)

4. The management concepts for primary operating stocks, war readiness spares support, and for battle damage repair must be estimated prior to OT plan development. (PM)

5. Candidate spares for maintenance concept must be identified. (PM)

6. An Integrated Logistics Support Plan (ILSP) must be developed which accurately reflects the maintenance concept and CONOPS. (PM)

a. Identify the risks and limitations in the spares which support OT. For spares with limited availability, define how quickly they must be replenished. (PM)

b. The projected number of spares and rates of replenishment must support the operations tempo of the OT. (PM)

7. Validate that a successful Logistics Demonstration was conducted which verified that the training material, level of maintenance, sparing concept, repair/replacement criteria had been met by the system. (PM)

Figure X–27. Sufficiency of spares OT entrance criteria template

TEMPLATE 28

Test Assets and Support

Packaging, Handling, and Transportation

1. Shipping containers, packaging, handling, and transportation components and methods must be fully qualified and expected to meet the requirements stated in the ORD. Operationally representative maintenance demonstration scenarios must be used. (PM)

2. Adequate numbers of production representative shipping containers and packaging must be used to transport all test articles to the OT sites. (PM)

3. TOs must be validated and available to support the OT plan and schedule. (PM)

4. Shipping, transportation, receiving, and storage arrangements must be in place with the contractor and host base transportation offices to ensure timely shipping, receiving, and resource protection of test and support assets. (OT)

5. OT test player maintenance personnel must be adequately trained. (See Template 22—Test Team Training.) (PM)

Figure X–28. Packaging, handling, and transportation OT entrance criteria template

TEMPLATE 29

Test Assets and Support

Support Agreements and Support Contractors

1. MOUs and MOAs should establish the availability of test and support resources needed to support the OT plan and schedule. (OT)

2. For multi-Service testing, comply with the terms of the "MOA on Multi-service Operational Test and Evaluation and Joint Test and Evaluation (MOT)." (OT)

3. Host base support agreements should be established for using required ranges, test facilities, airspace, frequencies, etc., and base support functions such as supply, transportation, and billeting. (OT)

4. Necessary support agreements should be established with other Government agencies for such functions as data processing, failure analysis, communications, and security. (OT)

5. The potential for conflict of interest must be strictly avoided, mitigated, or neutralized before any contractor is allowed to participate in the support of OT. (OT)

6. All contractor assistance or services required to support OT must be identified in the OT event design test plan and TEMP. (Some types of contractor involvement are prohibited by public law.) (OT)

7. The potential for conflict of interest must be strictly avoided, mitigated, or neutralized before any contractor is allowed to participate in the support of OT. (OT)

8. System contractor report generation procedures must be established for depot-level repair and maintenance actions. (PM)

9. Support contractor services must be established for any required data collection, reduction, and analysis capabilities needed in OT that are not performed by green suiters. (OT)

Figure X–29. Support agreements and support contractors OT entrance criteria template

TEMPLATE 30

Test Assets and Support

Threat Systems

1. Test threat "shot doctrine" and employment tactics must be correlated to the CONOPS and the STAR. (See Template 4–STAR.) (PM)

2. Test threat "shot doctrine" and employment tactics must be correlated to the CONOPS and the Test threat systems and related support required for OT, including M&S assets, must be identified and programmed as early as possible. (OT)

3. Test threat "shot doctrine" and employment tactics must be correlated to the CONOPS and the Test threat systems and M&S assets must be undergo VV&A before use in OT. (See Template 25—M&S.) (OT)

4. Test threat "shot doctrine" and employment tactics must be correlated to the CONOPS and identify known system limitations and voids in covering the threat spectrum. (PM)

a. The system must demonstrate credible potential to meet the required capabilities against the threats described in the ORD and STAR. (PM)

b. If the system will be certified in increments of increasing capability, describe what capabilities are lacking at this time. (PM)

c. Develop a comprehensive plan for dealing with system capabilities deferred past OT into FOT&E. (PM)

d. Identify known test threat limitations and voids in covering the threat spectrum. (SE and OT)

e. Where limitations exist in test threat systems used for OT, obtain approval to fill gaps with facility testing and M&S. (PM)

5. Sufficient threat densities must rigorously stress the system in an operationally relevant combat environment. (See Template 24—T&E Infrastructure.) (PM)

6. Develop a data reduction and correlation plan for using all valid threat testing data. (PM)

Figure X–30. Threat systems OT entrance criteria template

TEMPLATE 31

Test Assets and Support

Technical Data

1. Operator and maintainer technical data must be available to support the OT plan and schedule and be acceptable to the OT test director. (PM)

a. Technical Orders (TOs) from other interoperable systems (hardware, software, and GFE) must be available to support the OT plan and schedule. (PM)

b. Technical data required to evaluate system suitability and software supportability (includes engineering drawings, lists, specifications, standards, process sheets, manuals, technical reports, catalog items, documentation of computer programs and related software) must be available to support the OT plan and schedule. (PM)

2. TOs must be validated prior to use in OT. (PM)

3. A Technical Order management activity must be in place to manage TO deliveries, changes, and other TO requirements. Procedures must be established to process changes to technical data and TOs. (PM)

Figure X–31. Technical data OT entrance criteria template

TEMPLATE 32

Test Assets and Support

Central Technical Support Facility (CTSF)

1. Intra-Army interoperability certification applies to all Army operational-through tactical-level C4I systems prior to release to the field, regardless of the acquisition category. Communications/data interfaces testing in support of intra-Army interoperability certification will be addressed in OTRRs and considered entrance criteria prior to decision reviews, operational testing, and materiel release. (CIO/G-6)

2. Establish CTSF testing timelines for intra-Army certification. (CTSF)

a. Initial Coordination & System Identification - Initial contact from system representative requesting certification testing. (TSM or PM)

b. Initial Coordination Meeting - The system's representative: identifies issues, tours facility, and identifies and coordinates for special equipment. (PM)

c. Test schedule will slip if the following requirements are not met:

(1) PM submits certification funds to CTSF IAW the instructions in chapter 4. (PM)

(2) The CTSF begins development of the test plan that will outline basic architecture requirements, required systems interfaces; base test cases, funding restrictions and other pertinent data. (CTSF)

d. Test Report delivered to CIO/G6. The final Test Data Report, signed by the CTSF Technical Director, Test Cell Director, and the Test Officer will be sent to CIO/G6. CIO/G6 will notify the system's TSM/PM of their certification status. (CTSF)

Figure X–32. Central Test Support Facility OT entrance criteria template

TEMPLATE 33

Test Assets and Support

Joint Interoperability Testing

Under the provisions of DoD Directive 4630.5, "all C4I systems developed for use by US forces are considered to be for joint use." The Joint Chiefs of Staff have published the TADIL-A/B/J and USMTF standards that are designed to ensure systems meet end users information exchange needs as well as their interoperability requirements. Program Milestone C decisions now depend on joint interoperability testing and certification from the Joint Interoperability Test Command (JITC). The USA CECOM Software Engineering Center serves as the Army Participating Test Unit (APTU), and is responsible for the overall coordination of Army systems to be tested/certified by the JITC.

The following steps are followed by the JITC during joint system testing and certification:

1. PMs will afford JITC the opportunity to review applicable system documentation to include–

a. Mission Need Statement - used early during program development to identify high level interoperability requirements. (PM)

b. Capstone Requirements Document - provides the overarching view for Family-of-Systems/System-of-Systems. This is used by JITC to determine interoperability requirements with external systems. (PM)

c. Operational Requirements Document - includes the interoperability requirements (KPPs) and joint top level information exchange requirements (IERs) as defined by CJCSI 3170.01 and CJCSI 6212.01. (PM)

d. C4I Support Plan - This identifies C4 intelligence, surveillance, and reconnaissance infrastructure support and system interface requirements. (PM)

e. TEMP - The TEMP is used to determine the scope and manner that system interfaces will be examined during the testing process. Identify in the TEMP required CTPs and COIs that address interoperability. (PM)

2. Development Test - The PM will work with JITC to ensure that the system conforms to the JTA-A or other applicable standards. (PM)

3. Operational Test - JITC will work with the Operational Test Agency (OTA) to ensure adequate interoperability testing is accomplished and suitable data is provided to the JITC for evaluation. Interoperability evaluations will continue throughout the entire life cycle of each system. Based on DT, JITC will provide a recommendation as to whether a system is ready for OT. (PM)

Figure X–33. Joint interoperability testing OT entrance criteria template